

REMARKS

Claims 1-33 remain pending. Applicant respectfully disagrees with the Examiner's arguments and rejections of the pending claims for the reasons below.¹

Allowable Subject Matter

Applicant acknowledges with gratitude the Examiner's indication of allowable subject matter in claims 6, 16, 17, 23, 32 and 33.

Rejection of Claims 1, 2, 18, 19 Under 35 U.S.C. § 103(a)

Applicant traverses the rejection of claim 1 under 35 U.S.C. § 103(a) as allegedly not being patentable over U.S. Patent No. 6,321,197 to *Kushner et al.* ("*Kushner*")² in view of U.S. Patent No. 5,828,997 to *Durlach et al.* ("*Durlach*") and U.S. Patent No. 5,867,574 to *Eryilmaz*. The purported combination cannot support a rejection of claim 1 because the cited references, taken alone or in combination, fail to disclose each element recited in claim 1. In addition, there would be no reason for one of ordinary skill in the art to combine the cited references to arrive at the subject matter recited in claim 1.

A) **The Cited References Do Not Teach or Suggest All the Recited Claim Features**

1) *The Cited References Fail to Disclose or Suggest the Claimed "Random Parameter Extraction Unit"*

The Examiner apparently asserts that *Eryilmaz's* determination of a speech energy value and its comparison to a threshold to determine voice activity teaches "extracting random parameters indicating the randomness of frames from the frames input from the whitening unit." (Office Action, p. 7, *citing Eryilmaz* col. 2:30-55.) In support of this rationale, the Office Action states that *Eryilmaz's* remote voice activity detector 505 and local voice activity detector 506 provide the claimed "random parameters" because the "determination

¹ The Office Action contains statements characterizing the claims and related art. Regardless of whether any such statements are specifically addressed herein, Applicant's silence as to these characterizations should not be construed as acceptance of them.

² Applicant notes that the Office Action misidentifies *Kushner* as U.S. Patent No. 6,862,567.

of energy is random since it is not known whether the frame is voice or noise” and “randomness is addressed by indicating the noise or voice is present in the signal.” (*Id.*, emphasis added.)

To the contrary, the mere fact that something is “not known” does not make it random. The words of the claim must be given their plain meaning unless the plain meaning is inconsistent with the specification. (M.P.E.P. § 2111.01, *citations omitted*.) “In the absence of an express intent to impart a novel meaning to the claim terms, the words are presumed to take on the ordinary and customary meanings attributed to them by those of ordinary skill in the art.” (*LLC v. Intuitive Surgical, Inc.*, 334 F.3d 1294, 1298 67 USPQ2d 1132, 1136 (Fed. Cir. 2003), M.P.E.P. § 2111.01(III).)

Applicant has not specifically defined the term “random” and, thus, the term should be given its plain and ordinary meaning. The ordinary and customary meaning of “random” is “having no specific pattern, purpose, or objective: random movements.” (See *The American Heritage® Dictionary of the English Language*, 4th Ed., retrieved April 27, 2008, from <http://www.answers.com/topic/-randomness>.)

A voice signal, as disclosed by *Eryilmaz*, is not random at least because speech follows set patterns for the purpose of communicating information. As such, indicating whether a voice is present in a signal cannot be considered to disclose or suggest “random parameters.”

The Examiner argues “for a series of frames or frame, a different energy value may exist which indicates whether speech is present or not. It is determined that speech exists when above thresholds and non-speech when not within the thresholds.” (Office Action, p. 4, *citing Eryilmaz*, col. 2:38-54, *sic*.) However, as argued above, this determination merely indicates whether voice activity is present. Voice activity is not random and an indication of voice activity cannot be considered to teach or suggest “parameters indicating the

randomness of frames." Accordingly, *Eryilmaz* fails to disclose or suggest "a random parameter extraction unit for extracting random parameters indicating the randomness of frames from the frames input from the whitening unit" (emphasis added), as recited in Applicant's claim 1.

Accordingly, *Eryilmaz* fails to disclose or suggest the "random parameter extraction unit," as recited in claim 1. The Examiner has conceded that *Kushner* and *Durlach* fail to disclose or suggest this feature. (Office Action, p. 7.) Thus, *Kushner*, *Durlach* and *Eryilmaz*, taken individually or in combination, do not disclose or suggest the claimed "random parameter extraction unit" and, therefore, cannot support a *prima facie* case for rejecting claim 1 under 35 U.S.C. § 103(a).

2) *The References Fail to Disclose or Suggest the Claimed "Whitening Unit"*

The Examiner relies on *Durlach* for its alleged disclosure of Applicant's claimed "whitening unit." (*Id.* at pp. 2, *citing Durlach*, col. 5:55-56, Fig. 2.) However, the Examiner has conceded that "white noise is not used [in *Durlach*] when adding to the target signals." (*Id.* at p. 6.) Relying on Official Notice, the Examiner asserts, "it would have been obvious to add white noise to a signal or any other type of noise depending on the environment simulated." (*Id.*)

In response to Applicant's traversal of the Examiner's reliance on Official Notice, the Examiner cites U.S. Patent 5,768,474 to *Neti*, which the Examiner apparently relies on for its disclosure of "adding noise to clean speech signals. (*Id.* at p. 3, *citing Neti*, col. 6:4-29.) But *Neti* does not say anything with regard to "white noise" or "add[ing] white noise to a signal or any other type of noise depending on the environment simulated." Thus, it cannot be maintained that such features are well known and, therefore, *Neti* does not disclose or suggest a "whitening unit," as recited in claim 1.

The Examiner also concedes that *Kushner* does not disclose or suggest Applicant's claimed whitening unit. (*Id.* at p. 6.) Moreover, *Eryilmaz* does not disclose the claimed "whitening unit" and this patent is not relied on for disclosing such feature. Accordingly, when taken individually or together, the purported combination of *Kushner*, *Durlach* and *Eryilmaz* fail to disclose or suggest the claimed "whitening unit." The purported combination cannot, therefore, support a rejection of claim 1 under Section 103(a) for this additional reason.

B) The Applied References Cannot Be Properly Combined

One of ordinary skill in the art would have no motivation to combine *Kushner* and *Durlach* because there is no reason to modify *Kushner's* communication device 100, which only includes a single microphone 133, in view of *Durlach's* system, which determines whether to exclude inputs from several microphones 50a-50n.

1) *The Examiner Has Not Made the Findings Required to Support Obviousness Rejection under Section 103(a)*

The Examiner asserts that "the motivation to have combined the references involve the ability to incorporate the directionality of a signal for sound localization." (Office Action, p. 4:15-21.) However, this rationale is insufficient to support a *prima facie* case of obviousness necessary to support a rejection under Section 103(a).

It appears the Examiner's purported combination is based on a rationale that *Kushner* and *Durlach* can be combined according to known methods to predictably result in the subject matter of Applicant's claim 1. Applicant disagrees. M.P.E.P. § 2142(a) states that the Examiner must articulate the following to support a rejection under this rationale:

- (1) a finding that the prior art included each element claimed, although not necessarily in a single prior art reference, with the only difference between the claimed invention and the prior art being the lack of actual combination of the elements in a single prior art reference;

(2) a finding that one of ordinary skill in the art could have combined the elements as claimed by known methods, and that in combination, each element merely performs the same function as it does separately;

(3) a finding that one of ordinary skill in the art would have recognized that the results of the combination were predictable; and

(4) whatever additional findings based on the Graham factual inquiries may be necessary, in view of the facts of the case under consideration, to explain a conclusion of obviousness.

As already set forth above, the purported combination of references does not disclose or suggest the claimed "random parameter extraction unit" and "whitening unit." Thus, the rejection of claim 1 under Section 103 should be withdrawn for at least this reason.

Additionally, the Examiner has failed to articulate, at least: that each element of the applied references performs the same function as it would separately; that one of ordinary skill in the art could have combined the applied references; and that the result of the purported combination would have been recognized as predictable by one of ordinary skill in the art. Accordingly, the rejection under Section 103 is improper for these additional reasons and should be withdrawn.

2) Kushner and Durlach Cannot Be Properly Combined

Kushner is directed to speech recognition in a communication device 100, such as a cellular telephone, a portable telephone handset, a two-way radio, a data interface for a computer or personal organizer. (*Kushner*, col. 3:3-11.) Communication device 100 includes only a single microphone 133. (*Id.*)

In contrast, *Durlach* provides a system including a diversified microphone system to obtain information on the direction of a sound source. (*Durlach*, cols. 1:65-2:3.) In particular, *Durlach* discloses determining directional information used to include or exclude

time-varying signals $S_i(t)$ - $S_n(t)$ produced by several microphones 50a-50n. (*Durlach*, cols. 2:32-36, 5:54-6:16.)

The Examiner argues that the combination of *Kushner* and *Durlach* is proper because, in the case where *Durlach*'s system only includes one microphone ($n=0$), it could be combined with *Kushner*'s communication device 100, which only includes a single microphone 133. (Office Action, p. 3.) Applicant disagrees.

In the most limited case, *Durlach* discloses at least two microphones to obtain information on the direction of a sound source. (*Durlach*, cols. 1:65-2:3, 2:32-36; FIGs. 1 & 2.) As shown in FIG. 2, for example, the system includes microphones 20a, 20b, ... 20n. In the series, 'n' is not an integer value and Durlach does not disclose a case where "n=0", as asserted by the Examiner. (Office Action, pp. 3-4.) Thus, *Durlach* discloses, at least, two microphones 20a and 20b, which are used to determine the direction of a target sound source.

For instance, *Durlach* states "The source direction where there is only one sound location active at any one time can be determined for one angular dimension Θ using two microphones, which have inputs S1 and S2." (*Durlach*, col. 3:6-10, emphasis added.) The difference between the signal received at the microphones is used to determine direction. In particular, "The direction of the source is then determined by converting (α, τ) to Θ . This method can be applied where n source locations may be active at a given time by employing n+1 microphones and determine values for α_1 - α_n and τ_1 - τ_n ..." (*Id.* at col. 3:29-45.)

Thus, *Durlach* relies on finding the difference between two signals to determine a source direction. Modifying *Durlach* to have less than two microphones would render *Durlach* inoperative for its stated purpose of determining a direction of a target source. Indeed, making the purported combination with *Kushner* would repurpose all the components disclosed by *Durlach*. As such, these components would not perform the same

function as it did separately. Moreover, the components could not have been combined using known methods and one of ordinary skill in the art would not have recognized the result of the combination predictable. As such, it cannot be properly combined with *Kushner* for at least this reason.

Applicant submits that the Examiner's only reason for selecting and repurposing portions of *Durlach* for combination with *Kushner* is based on improper hindsight reconstruction using knowledge obtained from Applicant's own disclosure. (See, e.g., Applicant's FIG. 2.) The Examiner argues that the Office Action only uses knowledge available to an artisan. (Office Action, pp. 4-5.) However, when the ill-fitting combination of *Kushner* and *Durlach* is further combined with unsupported facts taken by Official Notice and what is, at best, a strained interpretation of *Eryilmaz* (*see supra*, pp. 2-4), it is apparent that the Examiner has cobbled together the various references in a manner that could only be achieved with improper hindsight reconstruction.

C) The Claims are Allowable Over the Cited References

For all the reasons set forth above, the applied references cannot support a rejection of claim 1 under 35 U.S.C. § 103(a). Applicant, therefore, respectfully requests that the rejection of claim 1 be withdrawn and the claim allowed.

Independent claim 18, although of different scope than claim 1, recites features similar to those recited in claim 1. Accordingly, claim 18 is allowable over the applied references for the same reasons set forth above with regard to claim 1.

Claims 2 and 19 depend from independent claims 1 and 18. Accordingly, claims 2 and 19 are allowable over the applied references for at least due to their corresponding dependence from claims 1 and 18.

Rejection of Claims 3-17 and 20-33 Under 35 U.S.C. § 103(a)

Applicant traverses the rejections of claims 3-17 and 20-33 under 35 U.S.C. 103(a) based on various combinations of *Kushner*, *Durlach*, and *Eryilmaz* with U.S. Patent No. 6,182,035 to *Mekuria*, U.S. Patent Application No. 2003/0216909 to *Davis et al.*, U.S. Patent No. 5,572,623 to *Pastor*, U.S. Patent No. 7,065,485 to *Chong-White et al.*, "An Adaptive KLT Approach for Speech Enhancement" by *Rezayee et al.* Claims 3-17 and 20-33 depend from independent claims 1 and 18 and, therefore include all the limitations of the corresponding independent claims from which they depend. Applicant respectfully submits that none of these *Mekuria*, *Davis et al.*, *Pastor*, *Chong-White et al.* and *Rezayee et al.* disclose or suggest the above noted features of Applicant's claims missing from *Kushner*, *Durlach*, and *Eryilmaz*, and the Examiner does not assert that these references disclose or suggest such features. Accordingly, claims 3-17 and 20-33 are allowable over the applied references, whether taken alone or in combination, for the reasons already set forth above with regard to claims 1 and 18.

Conclusion

Based on the reasons as set forth above, Applicant respectfully requests allowance of all pending claims. If additional fees are required for any reason, please charge Deposit Account No. 02-4800 the necessary amount.

Respectfully submitted,

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